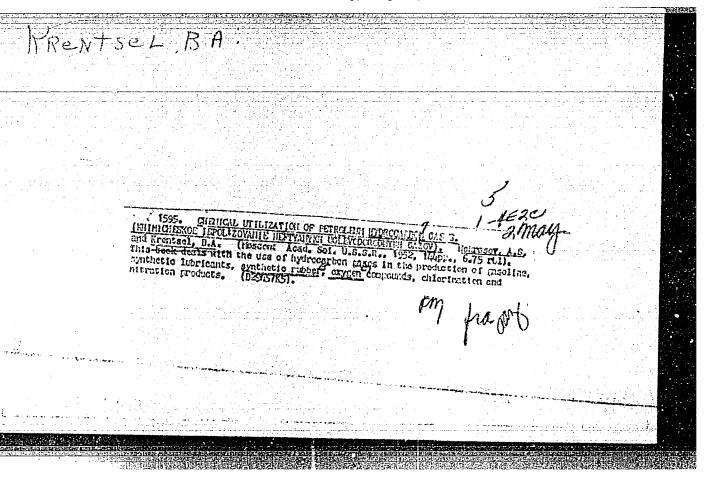


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Nov/Dec 51	Lowest Members of From Unsaturated Scow	importance of lower alithmatic petroleum cracking gases and for their production. sayon of alkyl sulfates; us, giving information on section (their compn.)	193721	ontd) Nov/Dec 51  "hydrocondensation" of     Ya. T. Eydus; reaction de (under formation of ; oxidation of propergyl	193721	
USSR/Chemistry - Alcohols Petroleum	"Advances in the Synthesis of the Lowe the Series of Aliphatic Alcohols From Hydrocarbons," B. A. Krentsel', Moscow"Uspekh Khim" Vol XX, No 6, pp 759-775	ic impor that pe terial f and sapo lefins,		ussm/chemistry - Alcohols (Contd) activation with BF <sub>3</sub> , etc.); "hydroconder olefins with CO actording to Ya. T. Eydu of acetylene with formaldehyde (under formangergyl alc or butynediol); oxidation alc to glycerine.	y 's familia.	

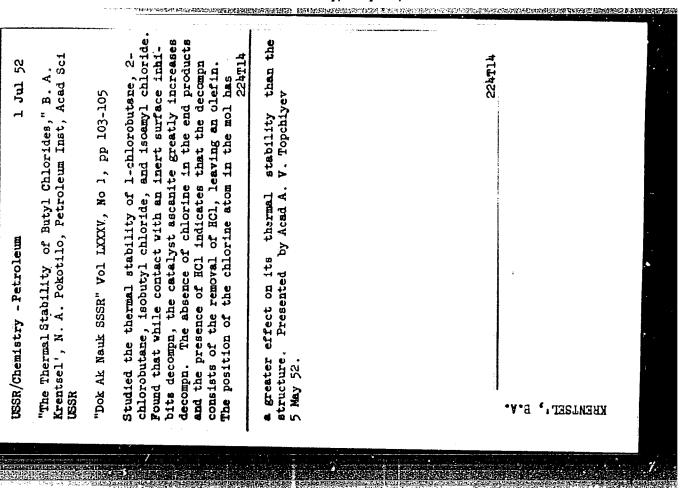
PA 193T21

- 1000000000000000000000000000000000000	PARTY WITH PROPERTY OF THE PROPERTY OF THE PARTY OF THE P	THE REPORT OF THE PROPERTY OF
USSR/Chemistry - Hydrocarbons  "Thermal Chlorination of n-Butane," B. A. Krenzel,  "In A. Pokotilo  "In This Khim," Vol XXIV, No 7, pp 726-732  Chlorination with 100% usage of Cl2 occurs at 3000c.  In this full Cl2 conversion sets in. At volumetric flow rates from 32-500, with excess of C3Hg of 4.5/1 lower C3Hg excess, monochlorides are formed. With lower C3Hg excess, monochloride yield does not exceed 80%. With insufficient C3Hg excess, dichlorobutanes are formed, which were not investigated.	USSR/Chemistry - Hydrocarbons (Contd)  The monochlorides are 1- and 2-chlorobutane, formed approx in 1: 1.64 ratio. 100% yield of dichlorobutane is obtained with use of catalysts such as active carbon and askanite in pure state or impregnated with CuCl <sub>2</sub> . Chlorination of C <sub>4</sub> H <sub>10</sub> under same conditions yielded mixt of n-propyl and i-propyl	KRENZEL, B. A.
	and the second s	



"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410



TA 227716 KRENTSEL!, B. A. USSR/Chemistry - Hydrocarbons, 1 Aug 52 "Some Kinetic Principles in the Thermal Chlorination of Normal Butane," Academician A.V. Topchiyev, B.A. Krentsel', L.N. Andreyev "Dok Ak Nauk SSSR" Vol 85, No 4, pp 823-826 The extent to which the utilization of chlorine for the thermal chlorination of n-butane in a flow process is dependent on the time the reagents remain in the reaction space and on the temp was investigated. The activation energy of the chlorination of butane was calcd from exptl data and found to be 39,000 cal/mole. 227216

# "APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410

KRENTSEL!, B. A.

USUR/Chemistry - Fuels, Alkylation

11 Sep 52

"The Thermal Process of the Destructive Alkylation of Pentane," Ya. M. Paushkin, Acad A. V. Topchiyev, B. A. Krentsek', I. M. Tolchinskiy, Inst of Petroleum, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 86, No 2, pp 321-323

The destructive alkylation of pentane," at high temps and pressures without the use of catalysts was carried out in a rotating autoclave. The optimum temp for converting pentane into liquid, high-boiling hydrocarbons lies between 450-460°; the pressure for this temper is 250-310 atm. The optimum time for the reaction is 2 hrs. Prolongation of time, as well as increase in temp, leads to formation of gaseous products. The hydrocarbons formed during the thermal conversion of pentane are a result of destructive alkylation, cyclization, and cracking of pentane with subsequent polymerization of the unsatd hydrarbons.

PA 235T27

1. TOPCHIYEV, A. V., KRENTSEL!, B. A., PAUSHKIN, YA. F., ROLCHTNISKIY, I. M.

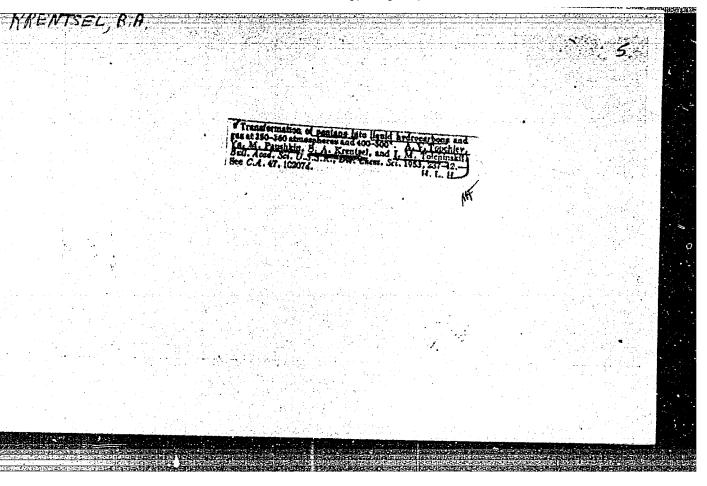
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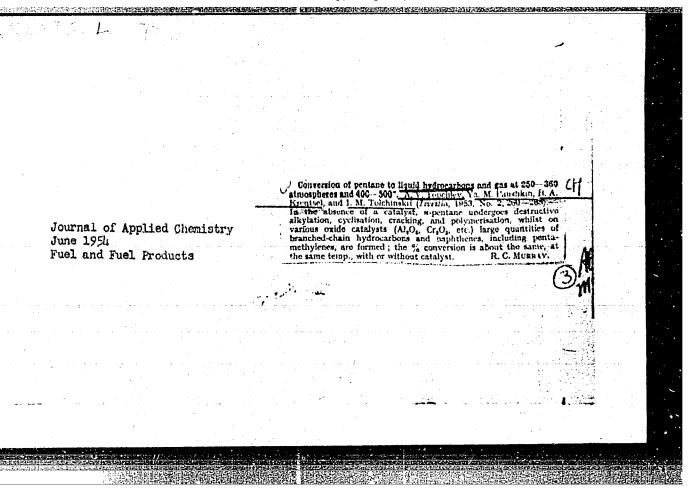
- 2. USSR (600)
- 4. Pentane
- 7. High temperature destructive alkylation of entane in the presence of oxidic catalysts. Dokl. AN SSSR 86 no. 4. 152.

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

	·		- नामकाक्ष्मकृत्यक् व्हानुह		et startischen vertiert	2的11年至4月2日 · 日本日本日本	注:"在1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年,1955年	为的的证据的 <b>是这种</b> 和是
	Dec 52	obutane," Acad A. V. and L. N. Andreyev	carbon to Cl on selound to be se of the chlord found that I in an increase	1	of isobutane se to that of		24 <b>0</b> IT	
	try - Chlorination Hydrocarbons	"Thermal Chlorination of Isobutane," Topchiyev, B. A. Krentsel', and L. N. "DAN SSSR" Vol 87, No 6, pp 999, 1000	effect of the ratio of hydrocarbon to Cl yield of monochlorbutanes was found to be iderably less than in the case of the ch on of n-butane. It was also found that ing the vol velocity resulted in an incre		of monochlorbutanes of the chlorination /mole, which is clo			
	USSR/Chemistry	"Thermal Ch Topchiyev, Topchiss "TAN SSSR"	The effect of the rathe yield of monochl considerably less the mation of n-butane.		in the yield tion energy of 20,000 cal n-butane.			
		ZT:01	PA 24				entsel", B. A.	TH.
14. A								

"APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826410





- 1. MEKRAGOV, A.S.; KREENTSEL', B.A.
- 2. USSR (600)
- 4. Hydrocarbons
- 7. "Chemical utilization of petroleum hydrocarbon gases." A.S. Nekrasov, B.A. Krentsel', Reviewed by B.A. Kazanskiy, YA. T. Eidus, Usp.khim. 22 no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

TO CONTRACT THE PROPERTY OF TH KRENTSEL, B. A. 11 Sep 53 USSR/Chemistry - Alkylation "Alkylation of Isopentane With Isopropyl Chloride and With Tertiary Butyl Chloride in the Presence of Sulfuric Acid," B. A. Krentsel', Acad A. V. Topchiyev, and L. I. Andreyev DAN SSSR, Vol 92, No 2, pp 319-322 Studied the alkylation of isopentane (I) with isopropyl chloride and with tert butyl chloride using H2SO14 as a catalyst. Noted the effect of the molar ration between I and the alkylating agent, the 269T15 effect of reaction time on the yield, the conc of the acid, and the characteristics of the reaction product.

### "APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410

CONTRACTOR CONTRACTOR

KATHYETLI, S. A.

USBB/Chemistry - Catalysts

21 Sep 53

"The Complex Aluminum Chloride-Sulfuric Acid as a Catalyst for Alkyliting Isopentane with Isopropyl Chloride or Tertiary Sutyl Chloride," Acad A. V. Topchiyev, L. N. Andreyev and B. A. Krentsel!

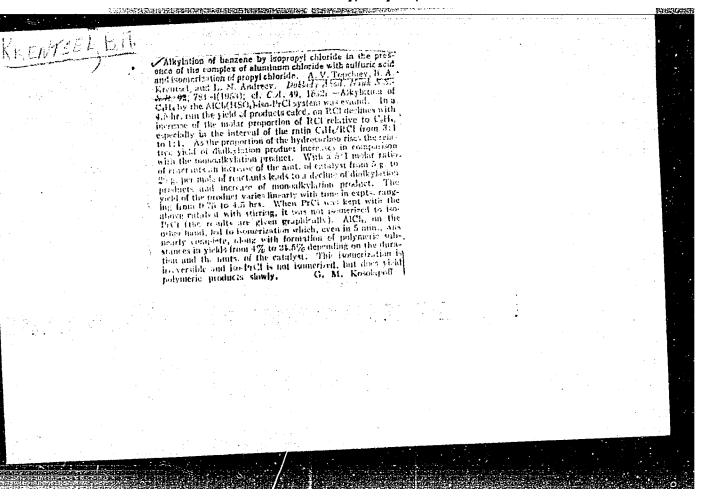
DAN SSSR, Vol 92, No 3, pp 577-500

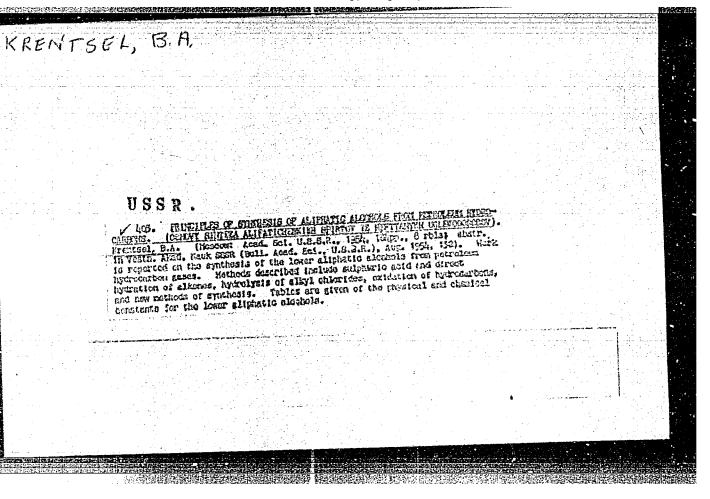
Studied activity of the above catalyst in the alkylation of isopentane with isopropyl chloride by determining molar ratios, reaction time, amount of catalyst, and characteristics of the aklylate. Also used the catalyst for the alkylation of isopentane with tertiary butyl chloride. Found that within the interval of 1.5-415 hrs, time has very little effect on the yield. The relationship between the amount of catalyst used and the product yield can be expressed by a log curve.

268T2

# "APPROVED FOR RELEASE: Monday, July 31, 2000

### CIA-RDP86-00513R000826410





\*\*REMITSEL', B. A.

"New Methods of Alcoholt Synthests" (Novyye metody synteza spirtov) - Chapter 5 of the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the book by the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the same author - "Fundamentals of the Synthesis of Aliphatic Alcohols from the same author - "Fundamentals of the Synt

KRENTSEL', B. A.

AID - P-106

Subject

USSR/Chemistry

Card

1/1

Authors

Topchiyev, A. V., Krentsel', B. A., and Andreyev, L. N.,

Moscow

Title

Interaction of Alkyl Chlorides with Paraffinic and

Aromatic Hydrocarbons

Periodical

Usp. Khim., 23, no. 1, 27-44, 1954

Abstract

Review of literature and of some patents on reactions of alkyl chlorides with various hydrocarbons. Catalysts for alkylation of aromatic hydrocarbons mentioned: aluminum chloride, metallic aluminum, aluminum amalgam, and the complex AlCl<sub>2</sub>·HSO<sub>4</sub>. Catalysts for alkylation of isoparaffins mentioned: AlCl<sub>3</sub>, solution of AlCl<sub>3</sub> in nitroparaffins, sulfuric acid, and the complex AlCl<sub>2</sub>·HSO<sub>4</sub>. Effect of alkyl halides on the octane numbers of fuels is noted. 63 references (22 U.S.S.R.):

1882-1953. 7 tables, 10 graphs.

Institution:

None

Submitted

No date

# KRENTSEL, B.A. USBR/ Chemistry - Alkylation Pub. 22 - 19/44 Card 1/1 Krentsel', B. A.; Topchiev, A. V., Academician; and Andreev, L. N. Authors Alkylation of benzene with n-propyl chloride and n-butyl chloride in the presence of the AlCl2 . HSO4 complex Title Dok. AN SSSR 98/1, 75-78, Sep 1, 1954 Periodical The alkylation of benzene with normal, primary alkyl-chlorides in the presence of the AlCl2 · HSO, complex as a catalyst was investigated. The alkylation reaction products derived and investigated. Abstract their physico-chemical properties, are described in tables. It was established that the AlCl2 · HSO4 catalyst used in the alkylation of benzene causes no isomerization of the alkyl chlorides as is the case with A1013. (1951 and 1953). Tables; graphs. Institution : June 25, 1954 Submitted

# KRENTSEL', B.A.

USSR/Chemistry - Reaction processes

Pab. 22 - 23/48 Card 1/1

Authors

: Topchiev, A. V., Academician; Andreyev, L. N.; and Krentsel', B. A.

: Reaction of naphthalin with isopropyl chloride in the presence of aluminum Title

chloride sulfuric acid complex.

1 Dok. AN SSSR 98/3, 411-414, Sep 21, 1954 Periodical

Experiments were conducted with commercial naphthalin and especially prepared Abstract isopropyl chloride to determine their reaction in the presence and in the

absence of inert solvents. The reaction between the naphthalin and the isopropyl chloride in the presence of #1012 · HSO4, as well as the process of naphthalin alkylation with the isopropyl chloride, are described. The physico-chemical properties of the reaction products obtained are listed. Five references: 4-USSR and 1-USA (1929-1954). Tables; graphs.

Institution:

June 25, 1954 Submitted

# KRENTSEL, B.A.

USSR/ Chemistry - Catalytic conversion

Pub. 22 - 23/49 Card 1/1

Topchiev, A. V., Academician; Tolchinskiy, I. M.; and Krentsel', B. A. Authors

Effect of pentenes and boron fluoride on the conversion of pentane Title

over an aluminum silicate catalyst

Dok. AN SSSR 98/4, 597-600, Oct. 1, 1954 Periodical

The effect of pentene additions on the yield of pentane conversion products, was investigated at high temperatures and pressures in the Abstract presence of an Al<sub>2</sub>(SiO<sub>3</sub>) catalyst. The promoting effect of BF<sub>3</sub> during the conversion of pentane over an Al<sub>2</sub>(SiO<sub>3</sub>) catalyst, was also stud-

ied. Resutls obtained during pentane conversion over an Al2(SiO3) catalyst in the presence of a pentene addition and conversion over an identical catalyst saturated with BF3, are shown in tables. Five references: 3-USSR; 1-USA and 1-English (1946-1952). Tables, graphs.

Institution :

June 25, 1954 Submitted

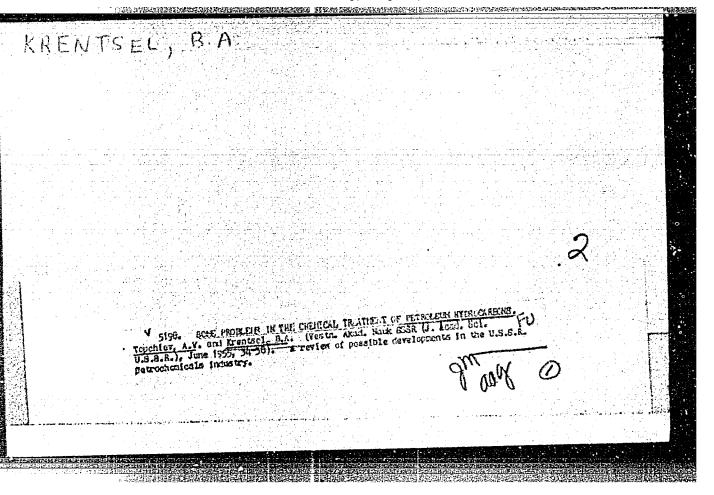
# [Study of the chlorination of gaseous paraffin hydrocarbons and certain conversions of alkyl chlorides] Issledovaniia v oblasti khlorirovaniia gazoobraznykh parafinovykh uglevodorodov i nekotorykh prevrashchenii alkilkhloridov; doklady na IV Mezhdunarodnom neftianom kongresse v Rime. Moskva, Izd-vo (MLBA 8:10) Akademii nauk SSSR, 1955. 66 p. (Paraffine) (Chlorination) (Alkyl chlorides)

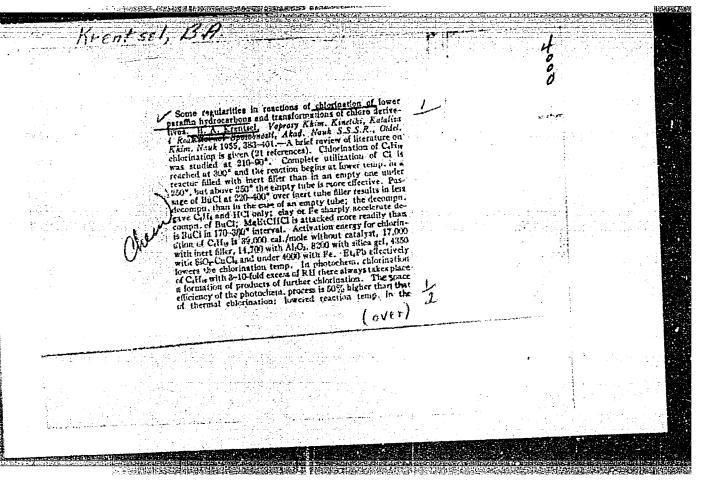
KRENTSEL, B. A. and TOPCHIYEV, A. V.

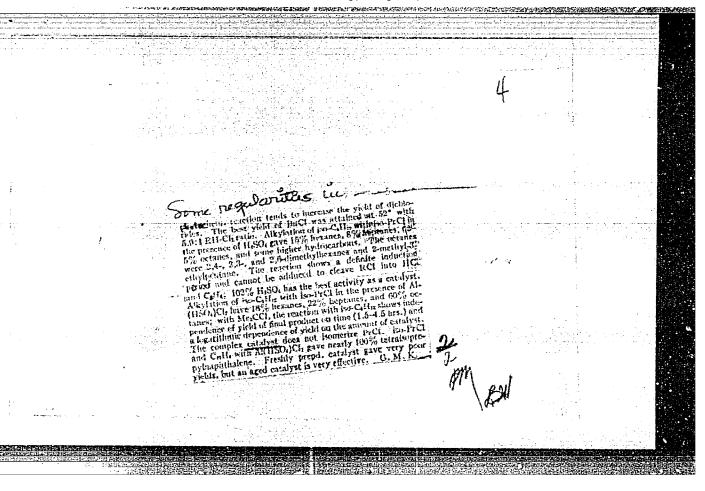
"A Study of the Chlorination of Gaseous Paraffin Hydrocartons and Certain Transformations of Alkyl Chlorides," Publishing House of Acad. Sci. USSR, Moscow, 1955.

A report presented at the 4th World Petroleum Congress of the Fermanent Petroleum Congress, Rome, Italy, 6-15 June 1955.

A-45189







TOLCHIESKIY, I.M.; KRENTSEL', B.A.; TOPCHIYEV, A.V.

Destructive alkylation of benzene with pentane. Izv.AH SSSR. Otd.
khim.nauk no.3:512-521 My-Je'55. (MIRA 8:9)

1. Institut nefti Akademii nauk SSSR.
(Alkylation) (Benzene)

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R0008264100

# KRENTSEL' , V. A.

USER/Chemistry - Hydrocarbon refining

Card 1/1

Pub. 124 - 5/32

Authors

1 Topohiyev, A. V., Academician, and Krentsel!, V. A., Cand. of Techn. Sc.

Title (Certain problem

\* Certain problems of chemical refining of petroleum hydrocarbons

Periodical

1 Vest. AN SSSR 25/6, 34-38, June 1955

Abstract

8 The problems involved in the development of industrial petro-chemical synthesis - production of alcohols, aldehydes, ketones, olefin oxides and other oxygen containing compounds, chlor-derivatives of hydrocarbons, various alkylated hydrocarbons, nitro-derivatives of hydrocarbons, etc. - are analyzed. It is pointed out that the thorough knowledge of chemistry and the introduction of progressive petroleum refining methods became possible only as a result of modern chemical science - theory of catalysis, catalytic conversion of hydrocarbons, etc.

Institution:

Submitted : ....

AID P - 3747

Subject

USSR/Chemistry

Card 1/1

Pub. 152 - 11/22

Authors

Topchlyev, A. V., M. V. Kurashev, and B. A. Krentsel'

Title

Synthesis of isopropylbenzene by means of alkylation

with Alcio HSO4

Periodical

Zhur. prikl. khim. 28, 9, 976-981, 1955

Abstract

The synthesis of isopropylbenzene from propylene and benzene (ratio, 1:2) was carried out in the presence of 15% catalyst, with a supply of 7.5 1./hr., at 25-30°C. The chemical composition of the alkylates obtained was determined (mono-, di-, tri-, and tetraisopropylbenzenes). Five tables, 33 references,

10 Russian (1936-1953).

Institution :

None

Submitted

J1 21, 1954

# "APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410

KRENTSEL', B.A.: LOKTEV, S.M.

Natural gas as a source of energy and chemical raw materials.

Priroda 44 no.11:28-35 N '55.

(Gas, Natural)

(Gas, Natural)

TOPCHIYEV, A.V., akademik, otvetstvennyy redaktor; KAZANSKIY, B.A., akademik, zamestitel' otvetstvennogo redaktora; OFITSEROV, V.V., redaktor; KHENTSELL', B.A., kandidat tekhnicheskikh nauk, redaktor; KURASHEV, M.V., kandidat tekhnicheskikh nauk, redaktor; KARAPETYAN, Sh.A., redaktor izdatel'stva; SHCHEKIN, V.V., redaktor izdatel'stva; MAKUHI, Ye.V., tekhnicheskiy redaktor

[Chemical processing of petroleum hydrocarbons; proceedings of a conference] Khimicheskaia pererabotka neftianykh uglevodorodov; trudy soveshchaniia. Moskva, Izd-vo Akademii nauk SSSR, 1956. 654 p.

(MLRA 9:12)

1. Vsesoyuznoye soveshchaniye pc kompleksnoy khimicheskoy pererabotke neftyanykh gazov.

(Petroleum-Refining) (Hydrocarbons)

KREMTSEL!, B.A.

"Status and Tasks of Scientific Research on the Chlorination and Nitration of Gaseous Hydrocarbons," Khimicheskaya Pererabotka

Neftyenykh Uglevodorov (Chemical Conversion of Petroleum Hydrocarbons),
Academy of Sciences USSR, Moscow, 1956, pp 277-288

Abstract in Sum 1429

# KRENTSEL' B.A.

I-13 USSR/Chemical Technology - Chemical Products and Their

Application. Treatment or natural games and petroleum.

Motor fuels. Lubricants.

: Referat Zhur - Knimiya, No 4, 1957, 12927 Abs Jour

Topchiyev A.V., Krentsel' B.A.

Principal Trends In Chemical Processing of Petroleum Author Title

Hydrocarbons

Khim. nauka i prom-st', 1956, 1, No 3, 248-258 Orig Pub

: A review of the present state of petroleum-chemical synthesis and the principal trends in its development Abstract

-- preparation of oxygen-containing products, chlorinated derivatives of hydrocarbons, polymerization of unsaturated hydrocartons. Considered are the sources of ray materials for petroleum chemical synthesis -- thermal conversion of heavy petroleum residues, high tempes rature processes of treatment of gaseous parafiln hy-

drocarbons, utilization of liquid petroleum hydrocarbons,

Card 1/2

\_ 238 -

CIA-RDP86-00513R000826410( **APPROVED FOR RELEASE: Monday, July 31, 2000** 

USSR/Chemical Technology - Chemical Products and Their I-13
Application. Treatment of natural gases and petroleum.

Motor fuels. Lubricants.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12927

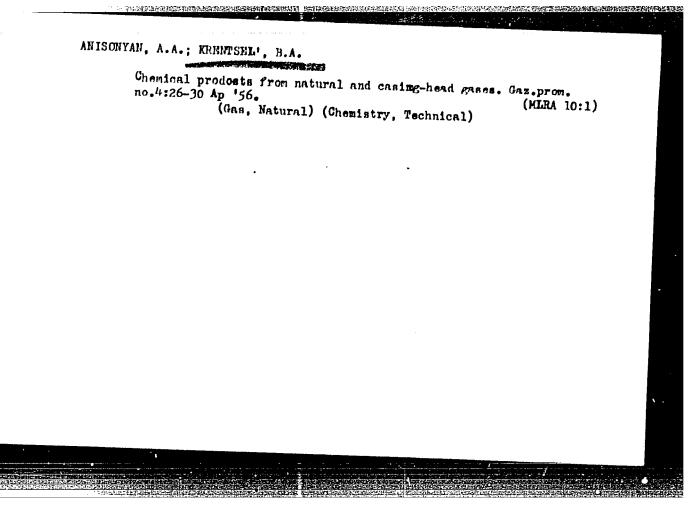
procedures for separation of mixtures of hydrocarbons.

Bibliography 28 references.

Card 2/2 - 239 -

## "APPROVED FOR RELEASE: Monday, July 31, 2000

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#### "APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826410 THE REPORT OF THE PROPERTY OF

KRENTSEL, B. A.

USSR/Chemical Technology, Chemical Products and Their Application -- Treatment of natural guses and

putroloum. Motor fuels. Lubricants.

Abs Jour: Rof Zhur-Khim ya, Ho 3, 1987, 9285

Krantsel, B. A. Author Inst

: Academy of Sciences USSE Title

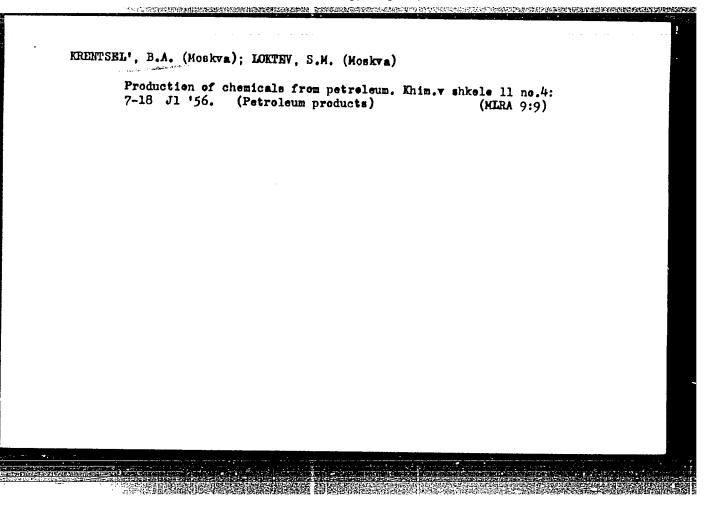
: Expanding the Raw Material Ease of the Petro-

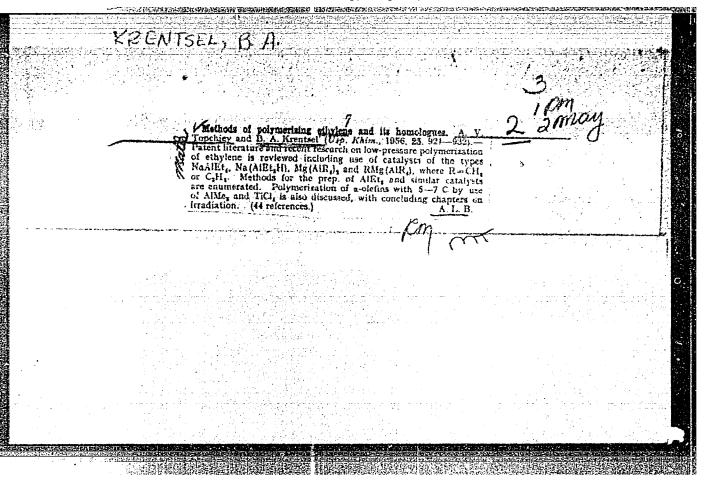
Orig Pub: Vestn. AN SSSR, 1986, No 6, 133-135

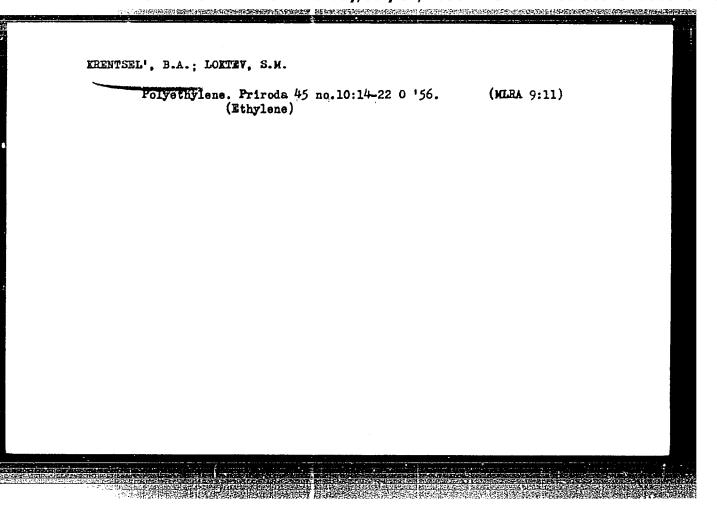
Abstract: A survey of the reports and transactions of the meeting of the scientific and technical council of the Praesidium of the Academy of Sciences USSR on 26 March 1956 at which the chemical processing

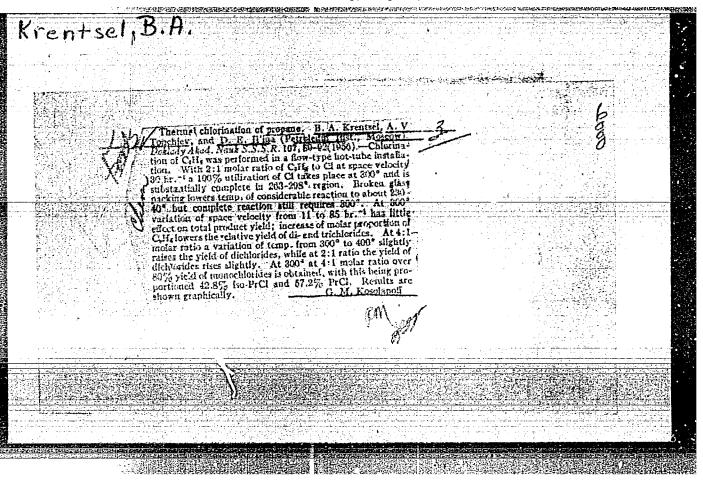
of petroleum hydrocarbons, the status of the production of unsaturated gaseous hydrocarbons from petroleum crude, and the future development of scientific research work were discussed.

Card 1/1









KKINTSEL, B, A.

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61467

Author: Topchiyev, A. V., Krentsel, B. A., Andreyev, L. N.

Institution: None

Title: Alkylation of Chlorbenzene with Isopropylchloride in the Presence

of the Complex AlCl2. HSO4

Original

Periodical: Dokl. AN SSSR, 1956, 107, No 2, 265-268

Abstract: There is gradually added to C<sub>6</sub>H<sub>5</sub>Cl (I) and AlCl<sub>2</sub>·HSO<sub>4</sub> (II) the (CH<sub>3</sub>)<sub>2</sub>CHCl (III), the mixture is left at 30-35° then decomposed

with water and the hydrocarbon layer is fractionated. Two fractions of starting materials are separated and 3 fractions of alkylate:
(1) BP 145-170°, (2) BP 170-210°, isopropylchlorbenzene, (3) BP

210-240°, polyalkylated I. Yield of alkylate with I:III ratios from 1:1 to 4:1 in presence of 10 g II per 1 mol III is ~71% and the amount of fraction (2) in alkylate increases from 40 to 70% of the amount of fraction (2) in alkylate increases from 40 to 70% of the latest the latest from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases from 40 to 70% of the latest fraction (2) in alkylate increases fraction (3) in alkylate increases fraction (4) in alkylate increases fraction (4) in alkylate increases fraction (5) in alkylate increases fraction (6) in alkylate increases fraction (7) in alkylate increases fraction (8) in alkylate (8) in alkyla

while fraction (3) decreases correspondingly from 16 to 4%. On

Card 1/2

。这个人,这个位在我们的不是一个人的人的人,但是一个人的人的人,但是一个人的人的人的人的人,但是一个人的人的人的人的人的人,但是一个人的人的人的人的人,也是一个

'USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

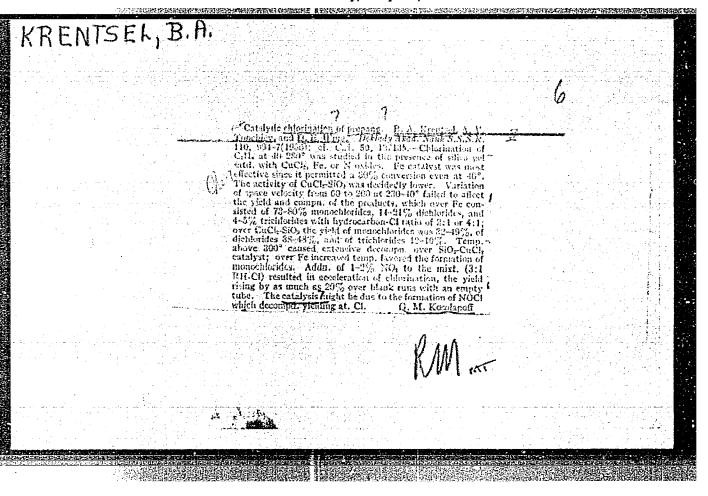
Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61467

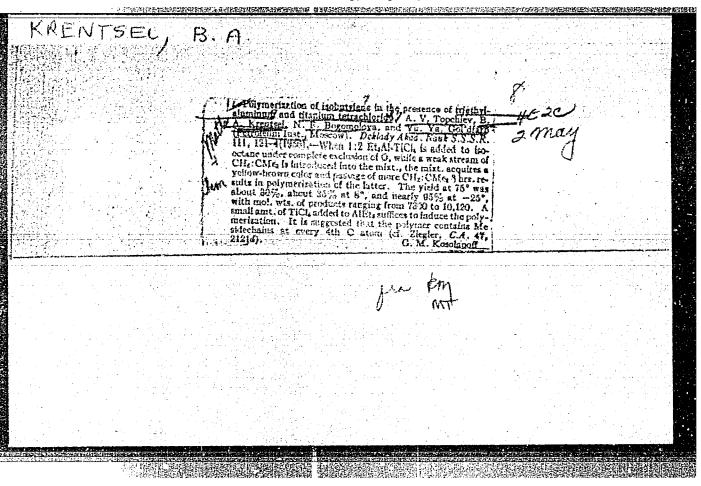
Abstract: increase and decrease of amount of II yield of alkylate decreases. The fraction BP 192-197° is officized with KMnO4 yielding p-clc6HgCOOH consequently main product of alkylation is p-(CH3)2CHC6H4C1.

Card 2/2

### "APPROVED FOR RELEASE: Monday, July 31, 2000

#### CIA-RDP86-00513R000826410





KKINIDER, E.H.

AUTHOR: Krentsel', B.A., Candidate of Chemical Sciences 26-10-11/44

TITLE: Polypropylene a New Synthetic Material (Novyy sinteticheskiy

material - polipropilen)

TERIODICAL: Priroda, October 1957, No 10, pp 81-84 (USSR)

ABSTRACT: Polypropylene - a stereoregular polyolefin - occupies one of

the first places among modern synthetic materials. This is due to its easily accessible raw material and to its several eminent properties. Polypropylene is capable of forming fibres equal to the best synthetic fibres. Objects made from

polypropylene, unless subjected to mechanical influence, preserve their forms in as high as 150° C. They can be used for numerous technical purposes as for manufacturing electric and

radiotechnical appliances, transparent films, etc.

The article contains 2 photos, 2 tables, 2 schematic drawings.

The bibliography lists one Slavic reference.

ASSOCIATION: Petroleum Institute of the USSR Academy of Sciences (Institut nefti

Akademii nauk SSSR), Moscow

AVAILABLE: Library of Congress

Card 1/1

KRENTSIL BIA.

AUTHORS: Topchiyev, A. V., Krentsel', B. A., Perel'man, A. I., 711-12-1/4

(Moscow).

TITLE: Polymerization of Olefinsinto High-Molecular Products by Means of

Oxide Catalyzers (rolimerizatsiya olefinov v vysokomolekulyærnyye

produkty na okisnykh katalizatorakh).

PERIODICAL: Uspekhi Khimii, 1957, Vol. 26, Mr 12, pp. 1355-1373 (USSR).

ABSTRACT: This paper contains all data concerning the catalytic effect of metal

> oxides in the polymerization of olefins. Oxides and mixed oxides of the VI., VII, and VIII. sub-group of the periodical system appear to be the most suitable. As carrier substances silicagel, kieselguhr,

aluminosilicates, Y-Al<sub>2</sub>O<sub>3</sub>, and active coal are used.

Also aluminosilicates have a catalytic effect, as e. g. floridine. The catalytic properties found to exist at different conditions have

been compiled from the passages referred to.

Mickel- and cobalt oxide catalyzers, their production and possibili-

ties of application are dealt with in the following.

A larger part of the paper deals with the catalytic effect of charamium oxide catalyzers. A paper by T. Rode on the Cr - 0 - phases is

dealt with in detail (reference 25). The dependence of the molecular

Card 1/3

weight of the reaction products on pressure and temperature is gras-

Polymerization of Olefins into High-Molecular Products by Means of 74-12-1/4

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phically represented) the mechanic and chemical properties of the polymerides and mixed polymerides obtained of ethylene, porpylene, etc. are compared in the table with other artificially produced substances as e.g. with polyvinylchloride and the American product marelex(marleks).

In the following molybdenum oxides and mixtures of molybdenum oxides with copper, zinc., nickel, and cobalt oxides are mentioned as catalyzers and shortly discussed.

The effect produced by catalyzers can be improved by the addition of metal hydrides. For this purpose the hydrides of alkalis and alkaline earths lithium "alkanate" and the boron hydrides of lithium, sodium, magnesium and aluminum. In connection with boron fluoride also metal fluorides can catalyze the polymerization reaction of the olefins.

Nothing exact is hitherto known concerning the mechanism of oxide catalyzis; a comparison between the efficacy of the various oxides showed that the oxides of the V - VIII sub-group are particularly suited for this purpose. The catalyzer effect can be considerably reduced by the treatment with hydrogen at 500°C. The ideas expressed by G. Natta (reference 37) concerning the mechanism of the polymerization reaction are given.

Card 2/3.

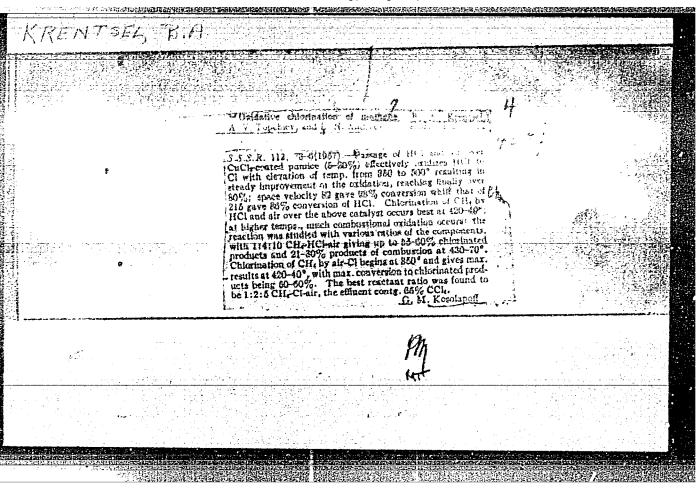
Folymerization of Olefins into high-Holecular Products by Heans of 74-12-1/4

There are 6 figures, 6 tables, and 73 references, 20 of which are

AVAILABLE: Library of Congress.

1. Olefins-Polymerization 2. Metal oxides-Catalytic effects

Card 3/3



#### "APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410

AUTHOR:

TOPCHIYEV, A.V., Member of the Academy,

20-3-32/64

TITLE:

KRENTSEL', B.A., TOLOHINSKIY, I.M., GARNISHEVSKAYA, G.V.
On the Production of Crystalline Polypropylene by the Polymerization

of Propylene by Means of a Metal-Organic Catalyzer. (O poluchemii kristalicheskogo polipropilene na metalloorganicheskom katalizatore,

Russian)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 113-115

(U.S.S.R.)

ABSTRACT:

The chemistry of polymeric compounds has recently been enriched by new methods of polymerization which make it possible to obtain

stereoregular crystalline poly- of -olefines.

The papers hitherto published contain hardly any data concerning the conditions of the synthesis of the polymerization products. Experiments hitherto carried out show that in the case of polymerization under atmospheric pressure as well as at increased pressure the best results were obtained (at a temperature of nearly 50°). As may be seen from table 1, practically the same results were obtained by working with pure and technical propyles. The X-ray picture of propylen disclosed the existence of sharp characteristic rings of crystalline material. The microphotogram did not differ

Card 1/2

On the Production of Crystalline Polypropylene by the Folymentzation of Propylene by Means of a Metal-Organic Catalyzer.

from that of NATT.

Investigation of the infrared absorption spectrum of propylene showed in the broad interval of temperatures the presence of strips (characteristic in the case of amorphous metal parts), which increase considerably by melting. (With 1 Table and 5 References).

ASSOCIATION: PRESENTED BY:

Not given

SUBMITTED:

AVAILABLE:

Library of Congress

Card 2/2

KRENTSEL, BA

20-5-22/48

AUTHORS:

Topchiyev, A. V., Academician, Krentsel', B. A., Il'ina, D. Ye.

TITLE:

Extensive Chlorination of Propane on a Moving Contact (Glubokoye khlorirovaniye propana na dvizhushchemsya kontakte)

PERIODICAL:

Doklady AN SSSR, 1957, Vol. 116, Nr 5, pp. 800 - 803 (USCE)

ABSTRACT:

In recent times there is a more and more increasing interest for the products of a thorough chlorination of hydrocarbons, especially of alkanes. Beside merely theoretical interest the polychlorsubstitutes are used as semiproducts for the production of poisonous chemicals, artificial fibres, and others. It is known that a considerable heat liberation complicates the process of the reaction of alkane chlorination. This leads in a series of cases to a practical impossiblility of the synthesis of the wanted chloride under industrial conditions. On the other hand, there is the posibility to carry out the chlorination on a moving chemically inert heat carrier as it is known from the petroleum working up. Due to a direct contact between the reagents and the heat carrier the reaction heat is comparatively easily conducted, the temperature regime of the process is conserved here. For this purpose a model device with a moving heat carrier ("mullite") was used. (figure 1). It runs in a closed cycle and is regenerated by the combustion of

Card 1/2

Extensive Chlroination of Propane on a Moving Contact

20-5-22/48

the carbon deposited on it. The experiments on the model device have shown that the yield of dichloride does not exceed 25 - 30 %. With the increase of the relation: chlorine: propane increases the degree of the pyrolysis. The characteristic of the products fractioned on a rectifing column is given in table 2. 1,1-, 1,2-, 1,3and 2,2-dichlorpropane, 1,1,2- and 1,2,3-trichlorpropane, 1,1,1,2and 1,1,2,2-tetrachlorpropane were isolated and their physical-chemical indices were determined. Higher chlorides were not investigated. The results of the mentioned experiments on a moving heat shown that this process can be important for a thorough propane chlorination. Furthermore the reaction products can be used for the destructive chlorination for the production of tetrachlorearbon and tetrachlorethylene. The moving heat carrier and a gradual introduction of chlorine are obviously the decisive factors which guarantee a normal course of the reaction in the case of a such thorough propane chlorination. There are 3 figures, 2 tables, and 3 references, none of which is Slavic.

SUBMITTED:

July 20, 1957

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Library of Congress

Card 2/2

KRENTSEL', B.A.

5(3)

PHASE I BOOK EXPLOITATION

SOV/1510

Topchiyev, Aleksandr Vasil'yevich, and Boris Abramovich Krentsel'

Poliolefiny--novyye sinteticheskiye materialy (Polyolefins, New Synthetic Materials) Moscow, Izd-vo AN SSSR, 1958. 100 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 15,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Redkollegiya nauchno-populyarnoy literatury.

Ed. of Publishing House: K.G. Miyeserov; Tech. Ed.: T.P. Polenova.

PURPOSE: The book is intended for technically trained personnel interested in the manufacture of synthetic materials.

COVERAGE: The raw material used in the manufacture of polyolefins, methods of production, properties of polyolefins, and their uses are discussed in this book.

No Soviet personalities or facilities are mentioned. No references are given.

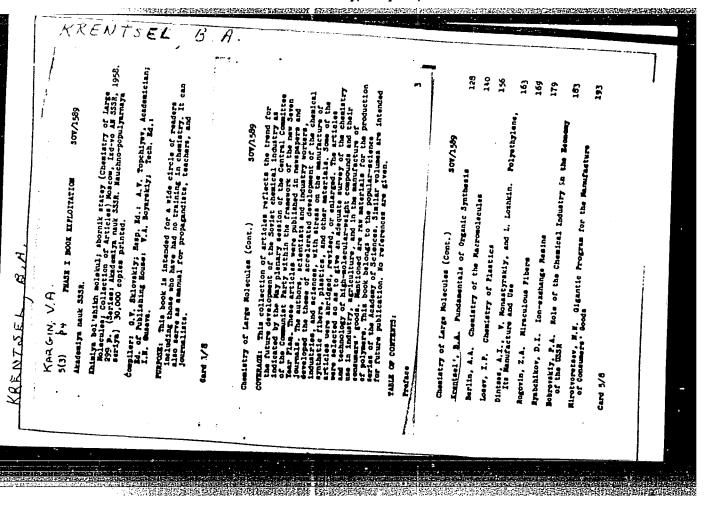
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"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826410



"On the Question of Applying Chromium Oxide or Molybdomum Oxide Catalysts to Obtain Crystalline Poly-G. -olering," paper no. R8. submitted at the International High-Polymer C interence, Nottin - ham 21-24 July 1998.

Aladem yu Nauk SSSR, Leninskiy Prospekt 14, Moscow, USSR

KRENTSEL BA

AUTHOR:

Krentsel', B.A., Candidate of Technical Sciences 25-58-3-4/41

TITLE:

Basis of Organic Synthesis (Osnova organicheskogo sinteza)

PERIODICAL:

Nauka i Zhizn', 1958, lh 3, pp. 12-16 (USSR)

ABSTRACT:

Various chemical processing methods of petroleum hydrocarbon are described and the importance of the process of polymerization is emphasized. Recently, scientists developed a new synthetic method of obtaining ethyl alcohol from ethylene. Ethylene is distilled under a pressure of 70 atmosphere and a temperature of 250 Cunder the influence of an acid catalyzer. In 1957, the Sumgait plant produced dozens of tons of synthetic ethyl alcohol. Besides alcohols, synthetic fatty acids obtained from petroleum are of great importance for the chemical industry. Soviet engineers and scientists elaborated a new method of oxidizing petroleum paraffin into fatty acids; this process is carried out by using liquid paraffin hydrocarbons. With the help of chemical petroleum syntheses, one of the most important tasks of Soviet national economy is being solved. Foodstuffs which were formerly used for technical purposes will be completely replaced by synthetic products. Soviet scientists were the first to find a new industrial method of

Card 1/2

Basis of Organic Synthesis

25-58-3-4/41

benzene. Moreover, the chemical synthesis of petroleum represents a valuable source for organic dyestuffs. An extensive research program is being carried out in Soviet research laboratories to obtain new materials of stereo-regular structures with even more valuable combination properties than polypropylene and polyethylene.

There are three sketches and one illustration.

AVAILABLE:

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Card 2/2

1. Petroleum-Synthesis 2. Polymerization-Processes

AUTHORS:

Topchiyev, A. V., Tolchinskiy, I. M.

62-58-3-26/30

Krentsel', B. Assert

TITLE:

On the Possibility of the Polymerization of Ethylene in

Polyethylene Into the Presence of Lithiumhydride,

Aluminumhaloid and Titanium Tetrachloride (O vozmozhnosti

polimerizatsii etilena v polietilen v prisutstvii

litiygidrida, alyuminiygaloida i chetyrekhkhloristogo titana)

PERIODICAL:

Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk,

1958, Nr 3, pp. 375-376 (USSR)

ABSTRACT:

Tsigler in his works maintained, that in heating ethereal solutions of lithium-aluminumhydride with ethylene (at a temperature of 180-200°C) a mixture of  $\alpha$ -olefines is formed

under pressure: butene, hexene, decene and dodecene. Corresponding to experimental data it is to be expected that the actual catalyst in this case is tetraethyl-lithiumaluminum. The latter is formed in consequence of the inter-

action of ethylene with lithiumaluminumanhydride

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 $\text{LiAlH}_4 + 4\text{C}_2\text{H}_4 \rightarrow \text{LiAl}\left[\text{C}_2\text{H}_5\right]_4$ . A formation of high-

On the Possibility of the Polymerization of Ethylene in 62-58-3-26/30 Polyethylene in the Presence of Lithiumhydride, Aluminumhaloid and Titanium Tetrachloride

molecular polymers of ethylene was not observed. It was of interest to produce triethylaluminum simultaneously as well as to obtain a polymerization of ethylene to polyethylene. The experiments were carried out in the autoclave in the medium of an inert solvent. It was shown that it is possible to produce polyethylene in the presence of lithiumhydride, aluminumhalides and titanium tetrachloride. Besides, there exists the possibility of a reaction as well as of a production of polypropylene by means of the same method. There is 1 reference, which is Soviet.

ASSOCIATION:

Institut nefti Akademii nauk SSSR (Institute of Petroleum , AS USSR)

SUBMITTED:

October 28, 1957

Card 2/2

#### CIA-RDP86-00513R000826410 "APPROVED FOR RELEASE: Monday, July 31, 2000

KRENISEL DA

AUTHORS:

Krentsel', B. A., Topchiyev, A. V.,

62-58-4-18/32

Lidorova, L. G.

TITLE:

Orystalline Polypropylene by Means Synthesis of of Polymerisation of Technical Propylene with Tri-iso= butylaluminum and Titanium Tetrachloride (Polucheniye kristallicheskogo polipropilena polinerizatsiyey tekh= nicheskogo propilena s triizobutilalyuminiyem i chety= rekhkhloristym titanom)

PERIODICAL:

Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh

Nauk, 1958, Nr 4, pp. 500-501 (USCR)

ABSTRACT:

In periodicals numerous reports have been published of late, concerning a new high-polymeric material: stereo-regular polypropylene. The latter was produced by the polymerisation of propylene in the presence of the complex organometallic catalyst  $\Lambda 1(C_2H_5)_3 + TiCl_{\Delta}$ It was of interest to use instead of the greatly py=

rophoric triethylaluminum especially high-molecular and less inflammable aluminum alkyls. In the present paper the authors describe the carried out polymeri=

Card 1/2

Synthesis Crystalline Polypropylene by Means of Polymerisation of Technical Propylene With Tri-isobutylalu= 62-58-4-18/32 minum and Titanium Tetrachloride

> sation of propylene in so high crystalline polypro= pylone in the presence of a complex organometallic catalyst, (Al(ic4H2)3+TiCl4) which is much less inflammable than  $\text{Al}(\hat{c}_2H_5)_3$ +TiCl...

There are 3 figures.

ASSOCIATION:

Institut nefti Akademii nauk SSSR (Petroleum

Institute, AS USSR)

SUBMITTED:

October 28, 1997

AVAILABLE:

Library of Congress

1. Propylene-Polymerization 2. Organometallic catalyst (Al (ic H<sub>9</sub>)3/Ti C<sub>4</sub>-Applications

Card 2/2

AUTHORS:

Topchiyev, A. V., Krentsel', B. A.

SOV/62-58-9-21/26

Sidorova, L. G.

TITLE:

Letters to the Editor (Pis'ma redaktoru )

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,

1958, Nr 9, pp 1133 - 1133 (USSR)

ABSTRACT:

Of late in publications several references were made in publications in regard to the mechanism of the stereospecific polymerization of the  $\alpha\text{-olefins}$ . In regard to these references the authors of this letter wish to report some experimental data gathered in investigations on the polymerization reaction of propylene in the presence of the catalytic system  $\text{TiCl}_4$  and  $\text{Al}(\text{i-C}_4\text{H}_9)_3$ .

Studies on the change in molecular weight of the polypropylene formed in the reaction show that already 15 seconds after the reaction begins a product of high molecular weight has formed. The duration of the reaction

does not change the molecular weight of the polymer formed. The structural chain keeps adding polymeric units in a

Card 1/2

chain reaction during the polymerization, as indeed the

Letters to the Editor

SOV/62-58-9-21/26

results of several experiments carried out by the authors showed that the propylene polymerization is a chain reaction. At the present the authors are concerned with further investigations on the mechanism and the function of the catalytic metallo-organic complex in the propylene polymerization and in the polymerization of other  $\alpha$ -olefins.

ASSOCIATION:

Institut nefti Akademii nauk SSSR (Petroleum Institute, AS USSR)

SUBMITTED:

May 29, 1958

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#### CIA-RDP86-00513R000826410 "APPROVED FOR RELEASE: Monday, July 31, 2000 ALINE PETATANAN TERMETAKAN PARATAN PETATAN PETATAN PENANGENTAN PENANGENTEN PENANGENTAN PENANGENTAN PERANGENTAN

7.16.18.10-2/51

AUTHORS:

Topchiyev, A.V., Academickacy Frenesel . B. L. Candidate of

Toohnical Sciences

TITLE:

The Chemical Synthesis of Perroleum (Neitekhimicheski, sinter)

PERIODICAL:

Friroda, 1938, Mar 10, pp 9-15 (ULBR)

ABSTRACT:

The history and process of cracking to described. Apart from liquid petroleum, catural est by project gases represent a valuable source of raw material. In 1950, the USCR will obtain 9 billion on m of by product gas. In 1965, 2.5 million tone of liquid hydrocarbons channed from there gases will be used in the chemical industry. Basic resparch into refining processes has been carried out by V.V. Markovníkov, N.D. Zelanskiy, S.S. Nametkin, etc. alcheugh the properties of the various fractions have still been insufficiently studied. New research methods being used are: spectrum analysis in the infracred and ultra-violet absorption bands; mass spectrometry; magnetic resonances etc. For obtaining pure fra:tions needed for the manufacture of synthetic fabors and products, low-temperature rectification (sometimes combined with absorption), is used. Recently, hypersorption the

Card 1/3

CIA-RDP86-00513R000826410(

adsorptionary breaking down of hydrocarbons in the moving

APPROVED FOR RELEASE: Monday, July 31, 2000

The Chemical Synthesis of Petroleum

307-26 55-10 2/51

layer of an adsorbent - has found a wide application. The author explains the purpose of the various refining processes, their application and the substances produced: 1) Oxidation: the USSR recently devised a method for the exidation of hydrocarbons by the continuous process using readily available liquid paraffine. The author also prelicts a bright future for the nathed of exidizing liquefied hydrocarbon gases at near critical temperatures and pressures using gas inturators. By this method, common butane can be broken selectively into abetic acid and methyl-sthyl ketone. The Gosudarstvennyy institut azotney promyshlennosti (The Stave Institute for the Nitrate Industry) has put forward a combined scheme for processing by-product gases. In the first stage of the process methanol, aretaldshyde and formaldehyde are obtained. The remaining gases are converted by high-pressure processing in the second stage into a synthesis-gas for obtaining synthetic ammonium. 2) Chlorination: a group of Soviet scientists, headed by Academician A.N. Nesmeyanov have devised a method of cutaining hydrocarbon tetrachloride by the chlorination of methane (natural gas). The hydrocarbon tetrachloride is used in the manufacture of a new, very strong, artificial fiber - ENANT. The production

Card 2/3

The Chemical Synthesis of Fetroleum

007-26-98-10-2/51

of hydrocarbon flucride derivatives still recessitates intermediate synthesis of appropriate hydrocarbon chlorides. Their uses in industrial production are listed, e.g. tetrafluorethylene, the initial compound from which polytetrafluorethylene (TEFLON) polymer material is produced. Mitration, alkylation and polymerization are discussed. The USSR Academy of Sciences is carrying out research into the process of the polymerization of ethylene using organic metal and oxide catalysts. The radiation polymerization of ethylene, propylene, etc, has a great future. Analysis of alkane radiolysis sheds valuable light on the nature of the hydrocarbon processes.

There are 2 schematic diagrams.

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ASSOCIATION:

Institut neft: Akademii nauk SSSR (Petrolaum Institute of the USSR Academy of Sciences - Moscow)

1. Petcoleur-Synthesic

Card 3/3

SOV/63-3-6-23/15

AUTHORS:

Markevich, V.A., Krentsel', B.A., Candidates of Chemical Scien-

ces, Okhlobystin, O.Ya.

TITLE:

Conference on Metal-Organic Syntheses (Soveshchaniye po metal-

loorganicheskim sintegam)

PERIODICAL:

Khimicheskaya nauka i promyshlennost', 1958, Vol III, Nr 6,

p 821 (USSR)

ABSTRACT:

In June 1958 a scientific-technical conference took place in Moscow dealing with metal-organic syntheses of alcohols, mencmers; acids, etc. The conference was attended by 50 specialists from 16 different organizations. The following papers were presented: 0.Yu. Okhlobystin, L.I. Zakharkin, Institute of Element-Organic Compounds, "The Use of Aluminum-Organic Compounds"; V.V. Gavrilenko, L.I. Zakharkin, Institute of Element-Organic Compounds."; V.V. Gavrilenko, L.I. Zakharkin, Institute of Element-Organic Compounds.

Compounds: "Synthesis of Carbonic Acids and Alkylhal on the Basis of Aluminumtrialkyls"; I.M. Eherlina, L.I.

Zakharkin, Institute of Element-Organic Compounds, "Production of Aldehydes From Nitryls and Pcuble-Decomposed Amides by Dissobutyl-Aluminumbydride Reduction"; V.K. Lisitsin, State

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Committee for Check to of the USSR Council of Ministers,

"这一个人,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们

Conference on Metal-Organic Syntheses

504/63-3-6-85/13

"Study of the Possibility of Industrial Production of Tetracthyl-Lead by the Electrolysis of Complex Compounds of Triethyl-Aluminum"; I.V. Garmenov, K.M. Chevychalova, All-Union Scientific Research Institute of Synthetic Rubber, "Synthesis of 2-Methyl-butylen-1 and 3-Mthylbuten-1 on the Basis of Propylen, & -Butylen and Ethylen With the Application of Triethyl-Aluminum"; M.I. Parberov, S.I. Kryukov, A.M. Kut'in, "Gelective Dimerization of Propylon and Ita dee in Technical Syntheses"; A.M. Sladkov, V.A. Markevich, Scientific Research Institute of Synthetic Alcohols and Organic Products. "Production of Higher Alcohols From Organic Compounds of Aluminum". It has been recommended to install an experimental-industrial plant for the production of simple alkyls and pure suspen el aluminum which are needed for metal-organic conthesis and which are not available in the necessary quantities. Colleguia should be arranged at intervals of  $\frac{1}{2}$  - 4 mention

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Andeyevskiy, D. N., Krentsel', B. A.

20-118-5-23/59

AUTHORS:

Topchiyev, A. V., Member of the AS USSR.

TITLE:

On the Thermodynamics of the Hydrochlorination Reaction of Isobutylene (K voprosu o termodinamike reaktsii gidrokhloriro=

vaniya izobutilena)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5,

pp. 931-934 (USSR)

ABSTRACT:

These reactions are equiponderant for unsaturated hydrocarbons. The thermodynamic calculation of the reaction mentioned in the title above is interesting. It is also of essential practical importance for the choice of the optimum parameters of the pro= cess. The authors give a short bibliography (references 1-3). At present the possibilities of a rigorous thermodynamic compu= tation of the reaction mentioned in the title are given, that is by using the molecular and spectroscopic data for tertiary butylchloride. Its molecule has a symmetry of the class C3v. It can be regarded as a C-Cl frame to which 3 symmetric -CH3

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gyroscopes are fixed. As the rotation of the methyl groups does

On the Thermodynamics of the Hydrochlorination Reaction of Isobutylene

20-118-5-23/59

not change the main moments of inertia for simplification the "shaded" model of the molecule was chosen that is, a C-H combination of each methyl group was regarded as being in the same plane as the C-C combination. With chosen angles and distances between the atoms (both given here) the atom coordinates show results which are given in table 1. The "z" axis coincides with the direction of the C-C combination. From that the moments of inertia of the whole molecule are computed. Their product I x I y z

= 1,400.10<sup>-113</sup>. The value of the molecular weight (92 569) and the last-mentioned product render it possible to compute the corresponding terms of the entropy of the free energy and of other thermodynamic functions of one mole of the respective gas in dependence on the temperature. For the entropy and for the free energy formulae (1) and (2) are derived. From these the values of the thermodynamic functions were computed which are caused by all progressive rotary motions (those of the CH<sub>2</sub> gyros=copes included) and by the oscillating motions of the molecules (table 2). These functions were computed with a potential of 2000 Kal per Mole which accords best with the experimental data (reference 1) with regard to the corrections because of the retardation of the rotation of the methyl groups. By combining the value

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On the Thermodynamics of the Hydrochlorination Reaction of Isobutylene

20-118-5-23/59

of ΔH° - E° from the table 2 for tertiary butylchloride 298,16 ° with the heats of formation of isobutylene and HCl, and the hydrochloration heat of isobutylene (according to reference 1) for the respective substance ΔH° Cal and E° Cal per mole are

obtained. In order to control the values thus obtained the free energies and the equilibrium constants of the reaction i=C1H8 + HC1 tertiary C1H9Cl were computed. The data for the choice of the potential level, as computed for hoook were taken from reference 1. Table 3 shows the results together with the values for with a potential of 3000 Cal per mole for several temperatures. They show that there is a good correspondence in a wide range (3000K - 10000K) for other temperatures as well. For the

range (300°K - 1000°K) for other temperatures as well. For the range from 300°K to 500° with intervals of 50° the composition of an equiponderant mixture for i-C<sub>1</sub>H<sub>8</sub>+HCl in a 1.1 ratio was calculated, and also at a pressure of 1 atmosphere excess pressure

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On the Thermodynamics of the Hydrochlorination

20-118-5-23/59

re and of 20 atmospheres excess pressure (table 4). The results are treated above.
There are 4 tables, and 6 references, 2 of which are Soviet.

SUBMITTED: February 22, 1957.

WCWTOEL, B. A., TOPCHIYEV, A. V.

"One negularities of Polymerization of -Olefins on Complex Netal-Organic and Oxide Vatalysts."

Report submitted If the Fifth Morld Petroleum Congress, 30 lay 
Secure 1979. New York.

KRENTSEL', B. A.: Doc Chem Sci (diss) -- "Investigation of the chlorination of gaseous paraffir hydrocarbons and certain transformations of alkyl chlorides".

Moscow, 1959. 20 pp (Inst of Petroleum-Chem Synthesis of the Acad Sci USTR),
120 copies (KL, No 1h, 1959, 118)

sov/62-59-2-35/40

Topchiyev, A. V., Krentsel', B. A., Perel'man, A. I., 5(3) AUTHORS:

Smetanyuk, V. I.

Polymerization of Ethylene on the Chromium-oxide Catalyst at TITLE:

Atmospheric Pressure and in the Absence of a Solvent

(Polimerizatsiya etilena na okisnokhromovom katalizatore pri

atmosfernom davlenii i v otsutstviye rastvoritelya)

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, PERIODICAL:

1959, Nr 2, pp 365-366 (USSR)

The authors report in the present news in brief that they suc-ABSTRACT:

ceeded in obtaining polyethylene on the chromium-oxide catalyst at atmospheric pressure and without a solvent at 110-180°. The yield of the polymer depends on temperature and on the time of contact of ethylene with the catalyst (Figs 1,2). A polymer

with the melting point of 123-137° and  $h_{\chi}$  0.4 - 0.5 was ob-

tained. Low-molecular (liquid) reaction products could not be detected. On the polymerization of ethylene without pressure but in the presence of a solvent no polymer was formed. The

oxygen content in ethylene (0.3-0.4%) did not influence poly-

Card 1/2

Polymerization of Ethylene on the Chromium-oxide Catalyst at Atmospheric Pressure and in the Absence of a Solvent

merization; at pressure, on the other hand, and in the presence of the solvent (according to data of publications) the admissible quantity of oxygen is considerably smaller. Under identical conditions also polypropylene was obtained. It could be found that on polymerization under pressure and in the presence of a solvent the activity of the chromium-oxide catalyst is connected with the presence of chromium-oxides of the valences between Cr and Cr II. The chromium-oxide catalyst which contained only Cr<sub>2</sub>O<sub>3</sub> without Cr I also did not polymerize ethylene and propylene in experiments without pressure and solvent. There are 2 figures and 3 references, 2 of which are Soviet.

ASSOCIATION:

Institut nefti Akademii nauk SSSR (Petroleum Institute of the Academy of Sciences, USSR)

SUBMITTED:

July 15, 1958

Card 2/2

5(3)

sov/62-59-2-38/40

AUTHORS:

Topchiyev, A. V., Krentsel', B. A., Gol'dfarb, Yu. Ya.

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TITLE:

Letter to the Editor

PERIODICAL:

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk,

1959, Nr 2, p 369 (USSR)

ABSTRACT:

In the present letter to the editor the authors write: As is known, heterocyclic compounds which are usually among the aromatic systems exhibit the properties of dienes up to a certain extent. This becomes especially manifest in compounds of the furan series which are able to combine with maleic acid anhydride. Less distinct becomes this fact in the case of thiophene. In this connection the possibility of a polymerization of such compounds in the presence of a complex organometallic catalyst which contained trialkyl aluminum and titanium tetrachloride was investigated. A number of experiments showed that furan,  $\alpha$ -methyl furan and thiophene in n-hexane form solid compounds in the presence of the catalyst mentioned. These compounds are practically insoluble in aliphatic and aromatic hydrocarbons. The product obtained from furan remains unchanged on heating up to 320°. The product formed from  $\alpha$ -methyl furan

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Letter to the Editor

SOV/62-59-2-38/40

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does not change up to about  $260^{\circ}$ . Thiophene polymerized under similar conditions forms a solid polymer that melts at  $\approx 180^{\circ}$ . The elementary analysis of poly-α-methyl furan shows the fol-

Found %: с 72.62; 72.59; н 7.64; 7.76 Calculated %: C 73.17

As to the products formed from non-substituted furan and thiophene, it has not been possible so far to obtain analytically pure samples. The investigations are being continued.

ASSOCIATION:

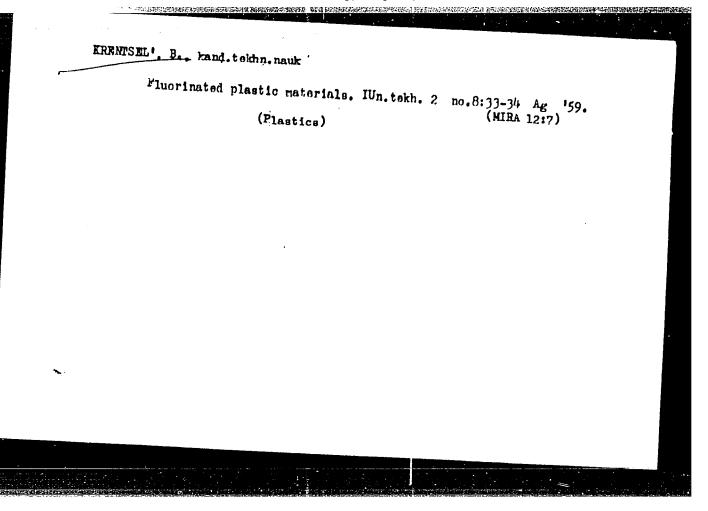
Institut nefti Akademii nauk SSSR (Petroleum Institute of the

SUBMITTED:

November 14, 1958

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Card 2/2



15(8)

SOV/25-59-3-11/46

AUTHOR:

Krentsel: B.A., Candidate of Technical Sciences

TITLE:

Polyolefins (Poliolefiny)

PERIODICAL:

Nauka i zhizn' 1959, Nr 3, pp 31 - 34 (USSR)

ABSTRACT:

The author stresses the importance of polyolefins, especially of polyethylene and polypropylene, and their wide field of application in industry and agriculture. He describes the synthetic process of obtaining these polymers, their basic properties and advantages and gives many examples of their use, e.g. as tubes (replacing metal ones), as covers for foodsturf and sheltering building material, in medical science as well as in textile industry, as cables and special containers, etc. As research on making new polymers is being continued, there are good prospects for better and cheaper products in the future. In 1965, a total of 24,000 tons of polyethylene tubes will be produced. There are 3

Card 1/1

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5 (3,4)

AUTHORS: Topchiyev, A. V., Krentsel', B. A., SOV/62-59-6-20/36

Perel'man, A. I., Rode, T. V.

TITLE: Chromium Oxide Catalysts for the Polymerization of Ethylene

(Okisnokhromovyye katalizatory dlya polimerizatsii etilena)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,

1959, Nr 6, pp 1079 - 1087 (USSR)

ABSTRACT: By way of introduction the chromium oxide catalysts which are successfully used for the polymerization, and which are mention-

ed in publications are enumerated. (Refs 1-4,5). The strong catalytic effect exercised by these catalysts is based upon the readiness of chromium to pass over from one valence stage into an other. In the present investigation the composition, the physico-chemical properties, and the dependence of the activity upon the production method of the catalysts, which were produced by impregnation of the aluminum silicate with CrO, and

chromium nitrate with successive activation at high temperatures, was investigated. Chromium, which is otherwise reduced

at high temperatures from Cr (VI) to Cr (III) remains in aluminum

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Chromium Oxide Catalysts for the Polymerization of SOV/62-59-6-20/36 Ethylene

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silicate almost completely as Cr (VI). This was proved by investigating the thermogram of the catalysts (method according to Balandin and Rode Ref 6), which exhibited an exothermal eifect (Tables 2,3) which is caused by the interaction of CrO, and aluminum silicate, and by which the Cr VI on aluminum silicate when heating to 3500 is preserved. The dependence of the activity of the catalyst was investigated with an aluminum silicate which was impregnated at first with  $CrO_{\chi}$  and then with chromium nitrate. Apart from the chemical analysis also the weight, the specific weight, and the porosity of the catalyst was determined. Its activity was determined by the quantity of the solid polymer formed. Furthermore, the influence of the activation temperature on the composition of the catalyst was studied. (Table 1). Here it was found that the lower the activation temperature is (300°), the higher is the portion of Cr VI. The catalyst, however, remains inactive because of the water still combined with the aluminum silicate. The activation temperature had therefore to be chosen in such a way that the de-

Card 2/4

Chromium Oxide Catalysts for the Polymerization of SOV/62-59-6-20/36 Ethylene

hydration of the aluminum silicate took place while on the other hand the Cr VI content in the catalyst remained almost unreduced. This was possible in a vacuum at 350°. Furthermore, a connection between the beginning of the active effect of the chromium catalyst and the formation of intermediate chromium oxides at 350° was found. Finally, the influence exerted by carrier substances on the activity of the chromium catalyst was investigated, and experiments with aluminum silicate, silica gel, aluminum oxide, and activated coal were carried out. Aluminum silicate and silica gel proved to be the best carriers for CrO3. The action of chromium catalysts as polymerizers is based upon their high sorption capability and the readiness of being reduced under the influence of high temperatures and in presence of hydrocarbons. The regeneration of the catalysts was also investigated. There are 7 figures, 5 tables, and 6 references, 2 of which are Soviet.

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Chromium Oxide Catalysts for the Polymerization of SOV/62-59-6-20/36 Ethylene

ASSOCIATION: Institut nefti Akademii nauk SSSR (Petroleum Institute of the

Academy of Sciences, USSR)

SUBMITTED: October 4, 1957

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Card 4/4

SOV/62-59-7-35/38 5(3) Topchiyev, A.V., Perel'man, A. I., Smetanyuk, V. I., AUTHORS: Krentsel', B. A. The Synthesis of Polypropylene on Chromium Oxide Catalyst ( Polu-TITLE: cheniye polipropilena na okisno-khromovom katalizatore) Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, PERIODICAL: 1959, Nr 7, pp 1346-1349 (USSR) A brief introduction is given concerning the data found in publi-ABSTRACT: cations concerning the production of the compound mentioned in the title with chromium oxide catalysts (Refs 1-4). The present paper deals with the investigation of the influence on the polymerization of propylene on chromium oxide by the addition of Al(alkyl)3. The experiments were carried out by A.N. Tsyba at the Institute mentioned in the Association. Without addition of Al(alk), 90% crystalline polypropylene was obtained with but a low yield. The reaction in an autoclave took place at a temperature of logo and a pressure of 25-30 atm and lasted 4-5 hours. The polymers obtained were investigated radiographically and thermomecha-Card 1/2

The Synthesis of Polypropylene on Chromium Oxide Catalyst

304/62-59-7-35/38

nically. The thermomechanical analysis was made by I. Yu. Marchenko. The table shows the characteristics of the polymers and secondary products. The yield of solid polymer was found to increase with rising ratio Al/Cr (Fig. 1). Thermomechanical investigations further revealed that the polypropylene obtained is a solid crystalline substance at 130°, whereas it becomes viscous at temperatures of 150°. There are 2 figures, 1 table, and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut nefti Akademii nauk SSSR (Institute of Petroleum of the

Academy of Sciences, USSR)

SUBMITTED: January 19, 1959

Card 2/2

'5 (3) SOV/62-59-8-38/42 Andreyev, L. N., Krentsel', B. A., AUTHORS: Litmanovich, A. D., Polak, L. S., Topchiyev, A. V. On the Radiation Synthesis of the Copolymer of Akrylonitrile TITLE: With Propylene Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk. PERIODICAL: 1959, Nr 8, p 1507 As is known, gaseous olefines do not easily polymerize under the ABSTRACT: influence of T-rays. The authors proved this fact also for propylene, which does not polymerize in a condensed state at room temperature and a radiation dose of ~ 5.0.106 roentgen. It was tried to copolymerize the easily polymerizing akrylonitrile with propylene under the influence of T-rays. The mixture of the two monomers was subjected to an integral radiation dose of 5.5-10.10 roentgen (7-co 60). The product obtained was extracted successively with dimethylformamide, n-heptane, and ether. The percentage of propylene links in the copolymer was determined from

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the elementary analysis of the remaining residue. At a change of the weight ratio of propylene and akrylonitrile from 0.75 to 0.15 the percentage of propylene links in the copolymerizate

On the Radiation Synthesis of the Copolymer of Akrylonitrile With Propylene

sov/62-59-8-38/42

decreases from 26 to 12%. The same copolymer was obtained by thermal copolymerization in the presence of benzoylperoxide at 75°. In this case the percentage of propylene links in the copolymer at a weight ratio propylene: akrylonitrile = 0.3 was 17%. There is 1 reference.

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ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR

(Institute of Petroleum-chemical Synthesis, Academy of Sciences,

ÚSSR)

SUBMITTED:

May 20, 1959

Card 2/2

VOLKOVA, N.S.; KHUTAHEVA, G.V.; KRENTSEL', B.A.; POGOVIN, Z.A.;
TOPCHIYEV, A.V.

Synthesis and study of stereorogular propylene - isoprene copolymers. Vysokom.soed. 1 no.12:1758-1763 D '59.

(MIRA 13:5)

1. Moskovskiy tekstil'nyy institut i Institut neftekhimicheskogo sinteza AN SSSR.

(Propene) (Isoprene)

#### CIA-RDP86-00513R000826410 'APPROVED FOR RELEASE: Monday, July 31, 2000

5(3) SOV/20-124-6-20/55 Topchiyev, A. V., Academician, AUTHORS: Krentsel', B. A., Pokatilo, N. A., Yerasova, Ye. L.

On the Polymerization of & -Butene With a Complex Metallo-TITLE: organic Multi-purpose Catalyst Al(C2H5)3 + TiCl4 (O polimerizatsii ∝-butena s kompleksnym metalloorganicheskim

katalizatorom Al(C2H5)3 + TiCl4)

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 6, PERIODICAL: pp 1255-1257 (USSR)

Since recently the problems of stereospecific polymerization ABSTRACT: of &-olefins with complex metallo-organic catalysts have attracted the attention of many research workers. This can be explained by the theoretical interest in polymerization reactions which yield stereoregular polymers on the one hand, and by valuable technical properties of the products formed, on the other hand. The mechanism of stereospecific polymerization of \alpha-olefins and the properties of the polymers were frequently the subject of publications (Refs 1-8). Least

attention in the discussion was paid to the synthesis of polymers with a high molecular weight on the & -butene Card 1/2

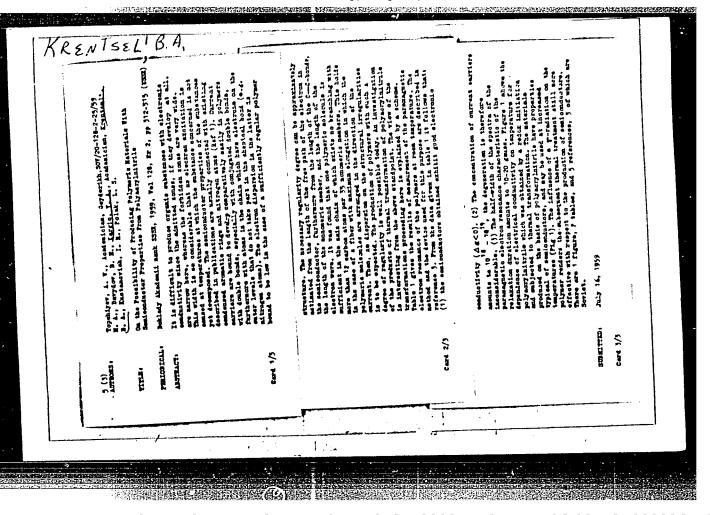
On the Polymerization of  $\propto$  -Butene With a Complex S0V/20-124-6-20/55 Metallo-organic Multi-purpose Catalyst Al( $^{\rm C}_2{}^{\rm H}_5$ )<sub>3</sub> + TiCl<sub>4</sub>

basis (Refs 5-8). This is what induced the authors to write the present paper. In an experimental part they deal with the production of the initial substance, course, duration, and details of the reaction as well as with the quantity of the catalyst used. The ready polymer is described with respect to its properties. Figure 1 shows the dependence of the polybutylene yield upon the duration of reaction. Figure 2 gives the radiograms of amorphous (a) and crystalline (b) polybutylene. From figure 3 the dependence of the characteristic viscosity of polybutylene (A) can be seen and that of the content of crystalline substances (B) on the molecular ratio of the catalyst (C<sub>2</sub>H<sub>5</sub>)<sub>3</sub>Al: TiCl<sub>4</sub>. Figure 4 reveals the dependence of the same viscosity (A) and the yield in polybutylene upon the reaction temperature. There are 4 figures and 9 references, 3 of which are Soviet.

SUBMITTED:

November 13, 1958

Card 2/2



APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R0008264100

#### CIA-RDP86-00513R000826410 "APPROVED FOR RELEASE: Monday, July 31, 2000

5 (2,3) AUTHORS:

Topchiyev, A. V., Academician,

SOV/20-128-4-27/65

NAMES OF THE PROPERTY OF THE P

Krentsel', B. A., Sidorova, L. G.

TITLE:

Some Rules of Polymerization of Propylene With the TiCl, + AlR,

Catalytic System

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 4, pp 732 - 735

(USSR)

ABSTRACT:

Different opinions were expressed in publications on the rules and mechanism of stereospecific polymerization of  $\alpha$ -olefines. Many problems in this respect have, however, remained unclear. Therefore, some observations made by the authors in dealing with the subject mentioned in the title are interesting. (AlR = Al(Iso-C4H9)3). The experimental system had been de-

serioed before (Ref 5). It can be assumed that an exchange reaction takes place between  ${\tt TiCl}_{A}$  and the metallic alkyl forming

organotitanium compounds (Ref 6). The latter decompose due to their instability, and form free radicals. The polymerization of styrene, for instance (Ref ?), can be initiated in this way. The organotitanium compound acts as a catalyst while the metal-

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Some Rules of Polymerization of Propylene With the SOV/20-128-4-27/65 TiCl<sub>A</sub> + AlR<sub>3</sub> Catalytic System

lie alkyl is, so to speak, a "supplier" of the alkyl radical. The propylene polymerization is a chain reaction. Already 17 seconds after its start, a polymer with a high molecular weight is formed (Fig 1) which remains unchanged for a long time (up to 1.5 hours). Thus, the molecule attains a maximum size, and does not grow any more. The catalytic activity of the complex catalysts of the Tsigler type decreases with time (Fig 2). This is possibly due to the fact that the amount of resulting organotitanium compounds is reduced with an increasing alkylation of titanium chlorides. Accordingly, the absorption rate of propylene also decreases. If, however, TiCl 4

is first poured into the reactor, and then aluminum alkyl evenly added at a low rate, e.g. within 3 hours, the activity of the catalyst is maintained for a long time, and the polymer yield is considerably increased. An explanation of these phenomena is attempted with reference to the assumption made by C. D. Nenitzescu (Ref 4). The polymerization process initiated by Tsigler catalysts is highly sensitive to admixtures of various types in the monomer, particularly to oxygen (Fig 3).

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